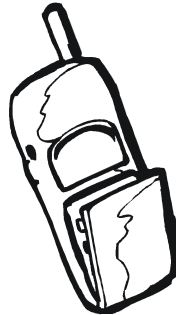


EKSISTERENDE HCI-RETNINGSLINJER FOR MOBILTELEFON

Oktober 2006

Redaktør: Riitta Hellman

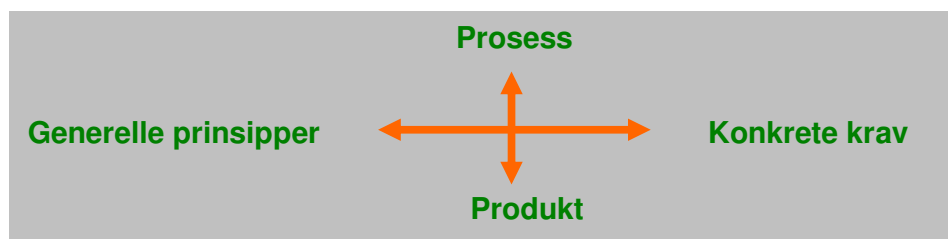
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Dette notatet oppsummerer *eksisterende* retningslinjer for utforming av brukerdialogen på mobiltelefon. Notatet er en delleveranse fra det IT Funk-finansierte prosjektet 'Norsk OSIRIS og universell utforming'. Retningslinjene som dette notatet refererer til er typisk rettet mot aksess av webinnhold på mobiltelefonen.

HCI-litteraturen er enorm, og det finnes hundrevis om ikke tusenvis av vitenskapelige artikler som på ett eller annet vis berører feltet grensesnittdesign og interaktivitet i forbindelse med mobiltelefonen. Svært mange publikasjoner som er blitt vurdert i denne sammenheng behandler svært smale områder av ekspertise. Eksempler på dette kan være utforming av spill på mobiltelefonen, TV på mobilen, eller navigering med kun en hånd. Vårt perspektiv er *tjenester*. Retningslinjene som er tatt med i denne oversikten et bredt dekkende for dette feltet, og inkluderer de fleste prinsipper som ulike samlinger av retningslinjer og råd inneholder. Eksisterende retningslinjer skal i dette prosjektet bli brukt som utgangspunkt for prosjektets arbeid med retningslinjer for utforming av *generelle* tjenester på mobiltelefon slik at også prinsippene for universell utforming blir realisert.

Det er viktig å legge merke til at enkelte prinsipper referer til *designprosessen* (for eksempel testing), ikke bare *resultater* av prosessen, dvs. selve utformingen av grensesnittet og tjenestens funksjonelle løsninger. En rask gjennomlesing viser også at mange prinsipper er svært generelle, med unntak av W3Cs retningslinjer som er meget konkrete. Ukritisk blanding av disse to dimensjonene sammen kan være uheldig når det gjelder både målsettinger og strukturering av en designprosess.



I forbindelse med dette prosjektet vil arbeidet ta sikte på å produsere egne retningslinjer som forholder seg ryddig til de ovennevnte dimensjonene.

Nedenfor presenteres eksisterende retningslinjer. Det er ikke utarbeidet oversettelse til norsk i og med at disse kun bli brukt som referansemateriale. Vi har også tatt med prinsippene for universell utforming i deres opprinnelige form. Disse prinsippene er styrende for prosjektets målsettinger om universell utforming i mobiltelefonens brukergrensesnitt.

1. Mobile Web Best Practices 1.0 – Basic Guidelines; W3C Proposed Recommendation 2 November 2006

Kilde: <http://www.w3.org/TR/mobile-bp/>

1. THEMATIC CONSISTENCY

Ensure that content provided by accessing a URI yields a thematically coherent experience when accessed from different devices.

2. CAPABILITIES

Exploit device capabilities to provide an enhanced user experience.

3. DEFICIENCIES

Take reasonable steps to work around deficient implementations.

4. TESTING

Carry out testing on actual devices as well as emulators.

5. URIS

Keep the URIs of site entry points short.

6. NAVBAR

Provide only minimal navigation at the top of the page.

7. BALANCE

Take into account the trade-off between having too many links on a page and asking the user to follow too many links to reach what they are looking for.

8. NAVIGATION

Provide consistent navigation mechanisms.

9. ACCESS KEYS Assign access keys to links in navigational menus and frequently accessed functionality.

10. LINK TARGET ID

Clearly identify the target of each link.

11. LINK TARGET FORMAT

Note the target file's format unless you know the device supports it.

12. IMAGE MAPS

Do not use image maps unless you know the device supports them effectively.

13. POP-UPS

Do not cause pop-ups or other windows to appear and do not change the current window without informing the user.

14. AUTO-REFRESH

Do not create periodically auto-refreshing pages, unless you have informed the user and provided a means of stopping it.

15. REDIRECTION

Do not use markup to redirect pages automatically. Instead, configure the server to perform redirects by means of HTTP 3xx codes.

16. EXTERNAL RESOURCES

Keep the number of externally linked resources to a minimum.

17. SUITABLE

Ensure that content is suitable for use in a mobile context.

18. CLARITY

Use clear and simple language.

19. LIMITED

Limit content to what the user has requested.

20. PAGE SIZE USABLE

Divide pages into usable but limited size portions.

21. PAGE SIZE LIMIT

Ensure that the overall size of page is appropriate to the memory limitations of the device.

22. SCROLLING

Limit scrolling to one direction, unless secondary scrolling cannot be avoided.

23. CENTRAL MEANING

Ensure that material that is central to the meaning of the page precedes material that is not.

24. GRAPHICS FOR SPACING

Do not use graphics for spacing.

25. LARGE GRAPHICS

Do not use images that cannot be rendered by the device. Avoid large or high resolution images except where critical information would otherwise be lost.

26. USE OF COLOR

Ensure that information conveyed with color is also available without color.

27. COLOR CONTRAST

Ensure that foreground and background color combinations provide sufficient contrast.

28. BACKGROUND IMAGE READABILITY

When using background images make sure that content remains readable on the device.

29. PAGE TITLE

Provide a short but descriptive page title.

30. NO FRAMES

Do not use frames.

31. STRUCTURE

Use features of the markup language to indicate logical document structure.

32. TABLES SUPPORT

Do not use tables unless the device is known to support them.

33. TABLES NESTED

Do not use nested tables.

34. TABLES LAYOUT

Do not use tables for layout.

35. TABLES ALTERNATIVES

Where possible, use an alternative to tabular presentation.

36. NON-TEXT ALTERNATIVES

Provide a text equivalent for every non-text element.

37. OBJECTS OR SCRIPT

Do not rely on embedded objects or script.

38. IMAGES SPECIFY SIZE

Specify the size of images in markup, if they have an intrinsic size.

39. IMAGES RESIZING

Resize images at the server, if they have an intrinsic size.

40. VALID MARKUP

Create documents that validate to published formal grammars.

41. MEASURES

Do not use pixel measures and do not use absolute units in markup language attribute values and style sheet property values.

42. STYLE SHEETS USE

Use style sheets to control layout and presentation, unless the device is known not to support them.

43. STYLE SHEETS SUPPORT

Organize documents so that if necessary they may be read without style sheets.

44. STYLE SHEETS SIZE

Keep style sheets small.

45. MINIMIZE

Use terse, efficient markup.

46. CONTENT FORMAT SUPPORT

Send content in a format that is known to be supported by the device.

47. CONTENT FORMATPREFERRED

Where possible, send content in a preferred format.

48. CHARACTER ENCODING SUPPORT

Ensure that content is encoded using a character encoding that is known to be supported by the device.

49. CHARACTER ENCODING USE

Indicate in the response the character encoding being used.

50. ERROR MESSAGES

Provide informative error messages and a means of navigating away from an error message back to useful information.

51. COOKIES

Do not rely on cookies being available.

52. CACHING

Provide caching information in HTTP responses.

53. FONTS

Do not rely on support of font related styling.

54. MINIMIZE KEYSTROKES

Keep the number of keystrokes to a minimum.

55. AVOID FREE TEXT

Avoid free text entry where possible.

56. PROVIDE DEFAULTS

Provide pre-selected default values where possible.

57. DEFAULT INPUT MODE

Specify a default text entry mode, language and/or input format, if the device is known to support it.

58. TAB ORDER

Create a logical order through links, form controls and objects.

59. CONTROL LABELLING

Label all form controls appropriately and explicitly associate labels with form controls.

60. CONTROL POSITION

Position labels so they lay out properly in relation to the form controls they refer to.

2. Mikko Nikkanen: One-handed use as a design driver: enabling efficient multi-channel delivery of mobile applications

Kilde: http://www.helsinki.fi/~mnikkane/publications/Nikkanen_One-handed_use.pdf

General design guidelines for mobile devices

1. DESIGN FOR USERS ON THE GO

The design for mobile devices must include context and forgiveness, and provide time-critical information.

2. ENABLE FAST USE

Two major considerations for the users of a mobile service are the cost of access and the speed of downloading content. Many users are paying for mobile services by the minute, so if they cannot get the information they are looking for within a short period of time they will stop using the service.

3. KEEP IT SIMPLE

The old adages about keeping a system simple stupid and about “less being more” certainly apply for mobile devices and services. For instance, the most successful PDA devices do not attempt to replace the PC, but to complement the PC use, and the use of some other traditional tools.

4. PROVIDE FEEDBACK AND NAVIGATION CUES

It should be obvious what the application is, and how one can navigate from the page.

5. INCLUDE SELF-RECOVERING CAPABILITIES

Even if the network goes down, the service or application need not. There should be means to restore the values or written text, or to have them restored automatically.

Content design guidelines for mobile devices

6. PRESENT THE MOST IMPORTANT CONTENT FIRST

The most important content should appear at the top of the page.

7. KEEP CONTENT COMPACT

It is recommended to keep the pages short.

8. DON'T MAKE THE PAGE LAYOUT COMPLICATED

It is recommended to keep pages simple and task-oriented, possibly text only, and to avoid elements that don't add direct value to the content.

9. USE SIMPLE TEXT ELEMENTS AND STYLES

The elements used in text layout should be clear and simple.

10. PAY ATTENTION TO PAGE TITLES

It is important that the page title elements are descriptive, since they enable bookmarking and knowing where one is. The titles should however be short, preferably less than 15 characters.

11. KEEP DOCUMENTS SMALL

Because there are various memory restrictions in mobile devices, the documents should be kept as small as possible.

12. USE COMPACT LINK NAMES

Long linked text can make a page difficult to read and time consuming to scroll. It is recommended to use only one or two words as the title of the link.

13. DESIGN CLEAR FORMS

Forms should not be too long. A clear way to cancel the form filling and for going back should be provided, but attention should be paid to form resets, since on small devices, forms are laborious to refill if all values are reset by accident.

14. USE SMART GRAPHICS

If graphics are used at all on small devices, they should be made informative, small and simple.

Navigation design guidelines for mobile devices

15. MINIMIZE STEPS IN NAVIGATION

With small screen devices, it is very important to design for economy of navigation. Users will be frustrated by scrolling through long lists of options, filling out complex search forms, and seeing needless pages along the navigation path.

16. SELECTING INSTEAD OF TYPING

It is recommended to consider whether it is possible to ask the user to choose from a default list using select lists, checkboxes or radio buttons rather than typing in a selection. Alternatively one can offer a default list together with an input box.

17. KEEP THE NAVIGATION CONSISTENT THROUGHOUT THE SERVICE

The way in which a user makes his or her way through the pages that constitute a service, interacting via links, menus and data input should be kept consistent throughout the service.

18. DESIGN FLAT MENUS

It is recommended to keep menus flat, because it is often difficult to form an overview of a service containing too many layers, and because a deep hierarchy makes the use more difficult.

19. CROSS LINK

The Back functionality is the most important way to go back. However, when users need to go back several levels, links to the starting page and subsection main pages are useful. A simple tree design is efficient, but the deeper the navigational hierarchy gets, the more necessary it becomes to get back to the starting point, and also to other pages.

20. PROVIDE CONFIRMATIONS FOR IMPORTANT ACTIONS

Confirmations must be there for actions like changing important values or deleting items. Even though the user needs to click OK on the confirmation page, that requires much less effort than e.g. returning to a list to check if an item was really removed.

21. SEARCHING SHOULD BE INTUITIVE

Searching should be a step-by-step, logical process. Once the search is performed, the results must be easy to scan, and the information should enable making good, informed choices within the results.

3. Grace Hays: Guidelines for User Interfaces for Mobile Devices

Kilde: http://www.developer.com/ws/article.php/10927_1143541_2

Application Guidelines

1. ORGANIZE DECKS AS WIZARDS THAT GUIDE A USER THROUGH SPECIFIC FUNCTIONS

Present only the information the user really requires. Minimize user interactions.

2. THE PRESENTATION LAYOUT SHOULD BE CONSISTENT ACROSS THE APPLICATION

Use the same types of elements for the same types of information and keep the application simple (also regarding to images and sounds).

Deck Guidelines

3. UTILIZE DECKS TO EFFECTIVELY DISPLAY AND GUIDE USERS THROUGH MULTIPLE "CARDS" OR SCREENS

Split large content bodies into multiple cards within a deck. Label cards using a "1 of 3" or "1/3" to show the total number of cards in the deck, and the current card location. When allowing the user to delete information, provide a confirmation card or "delete screen" so the user doesn't inadvertently delete input data.

Card Guidelines

4. SCROLLING SHOULD BE MINIMIZED

It is easier to move from card to card, than to handle lots of scrolling.

5. DO NOT LEAVE A ROW EMPTY

Some devices do not have scrollbars. Instead, use something to indicate that there is content following a blank line.

6. PUT TITLES ON YOUR CARDS

Try to keep these labels at five characters or less.

7. LIMIT CARDS TO NINE ITEMS PER CARD

Use a "More" link as the 10th item. Too many elements causes unnecessary scrolling and it is easy for the user to get lost.

8. AVOID WRAPPING THE TEXT OF LISTS OR MENU ITEMS AND LINKS

It clutters the screen and is less understandable to most users. Avoiding it allows the user to see more list items at a time. Wrapped links becomes difficult to read.

9. DO NOT DEFINE MORE THAN TWO SOFTKEYS

Many mobile devices do not support more than two.

10. USE SOFTKEYS

Use softkeys to accept or present options on cards that display information or confirm a user action. Users are most familiar with the softkeys, and proper set-up of the wizards will effectively guide users with these softkeys.

11. PROVIDE MULTIPLE PATHS TO THE SAME INFORMATION

For instance, to find a specific phone number, allow the entry of a zip code or city/state information.

12. DO NOT LET THE USER PROCEED AFTER ENTERING IMPROPER INFORMATION.

If you ask for a date, for example, validate the date before accepting more information.

13. CONSTRUCT AND USE INFORMATIVE TITLES ON INPUT FIELDS.

Communicate field type as well as format. Restrict length on input fields when possible, and distinguish between alpha and numeric fields. Avoid relying on font type and colour.

14. ONLY USE IMAGES OR ICONS WHEN THEY ARE NECESSARY

They take up precious screen space and bandwidth and can make the card too busy and unclear.

Navigation Guidelines

15. AVOID CARDS WITH INPUT FIELDS WHEN NAVIGATING BACKWARDS

Otherwise, as users press back/clear, they will erase the inputted values.

16. USE INTUITIVE LINKS OR SOFTKEYS

Use “previous” and “next” to guide the user linearly in the deck. Use “more” to indicate jumping to additional pages of the same data.

17. PUT NAVIGATION LINKS AT THE BEGINNING OR END OF A CARD

Avoid embedding links in text unless they are very context sensitive.

18. MAP THE SAFEST OR MOST COMMON ACTION TO THE “ACCEPT” OR “OK” SOFTKEY

19. LIST LINK CHOICES IN THE INTERFACE, NOT IN THE SOFTKEY OPTIONS

20. INCORPORATE A “DONE” SOFTKEY WHEN POSSIBLE TO POP THE USER UP TO THE NEXT HIGHEST LEVEL

4. The Principles of Universal Design

Kilde: http://www.design.ncsu.edu/cud/about_ud/udprinciples.htm

Principle One: Equitable Use

The design is useful and marketable to people with diverse abilities

GUIDELINES

- Provide the same means of use for all users: identical whenever possible; equivalent when not.
- Avoid segregating or stigmatizing any users.
- Provisions for privacy, security, and safety should be equally available to all users.
- Make the design appealing to all users.

Principle Two: Flexibility in Use

The design accommodates a wide range of individual preferences and abilities.

GUIDELINES

- Provide choice in methods of use.
- Accommodate right- or left-handed access and use.
- Facilitate the user's accuracy and precision.
- Provide adaptability to the user's pace.

Principle Three: simple and intuitive

Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

GUIDELINES

- Eliminate unnecessary complexity.
- Be consistent with user expectations and intuition.
- Accommodate a wide range of literacy and language skills.
- Arrange information consistent with its importance.
- Provide effective prompting and feedback during and after task completion.

Principle Four: Perceptible Information

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

GUIDELINES

- Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
- Provide adequate contrast between essential information and its surroundings.
- Maximize "legibility" of essential information.

- Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
- Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

Principle Five: Tolerance for Error

The design minimizes hazards and the adverse consequences of accidental or unintended actions.

GUIDELINES

- Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
- Provide warnings of hazards and errors.
- Provide fail safe features.
- Discourage unconscious action in tasks that require vigilance.

Principle Six: Low Physical Effort

The design can be used efficiently and comfortably and with a minimum of fatigue.

GUIDELINES

- Allow user to maintain a neutral body position.
- Use reasonable operating forces.
- Minimize repetitive actions.
- Minimize sustained physical effort.

Principle Seven: Size and Space for Approach and Use

Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

GUIDELINES

- Provide a clear line of sight to important elements for any seated or standing user.
- Make reach to all components comfortable for any seated or standing user.
- Accommodate variations in hand and grip size.
- Provide adequate space for the use of assistive devices or personal assistance.